Gas Quality & Interchangeability Update

Northeast End User / LDC Perspective

PAC Meeting, July 2007

Northeast Drivers For Change…….

- Served by a combination of regional and long haul pipelines as well as storage
- Several projects on the way including Northeast Gateway – December ’07
- Regional Enduser Stakeholder Group formed working with Algonquin Gas Pipeline (Spectra Company)
- Other stakeholders included producers, other pipelines and terminal operators

Survey Participants

- KeySpan
- PSE&G
- Connecticut Natural
- Southern Connecticut
- NISOURCE
- NStar
- ConEd
- New England Gas
- Middleboro Gas & Elec
- Bay State

Our Goal……

- Work Collaboratively with Pipelines & Suppliers to understand potential impacts of new supplies on end use & address gas quality issues appropriately in Pipeline Tariffs
- Understand which end use applications may need "adjustments" prior to introduction of new supplies
- Qualify and Quantify end use applications that may require retrofits of "substance" & *negotiate best economic "fix"*

A purge burner igniting manufactured gas being replaced in a main by natural gas during the 'great conversion' in 1952

Impact of Recent FERC Decisions

- FERC has recognized that the *NGC+ White Paper* needs to be considered – not simply the interim guidelines

  Don't forget Finding #10 & Recommendations #6 & 10 !!!

- *Stop whining* unless your directly connected to the pipeline under consideration

- ***MUST SHOW IMPACTS BASED ON SOUND ENGINEERING and DATA…… No "What if's"***

- ***End Use retrofit cost recovery is not within FERC's jurisdiction ??***

Interchangeability Implementation Process

1 — Understand Historical Supply

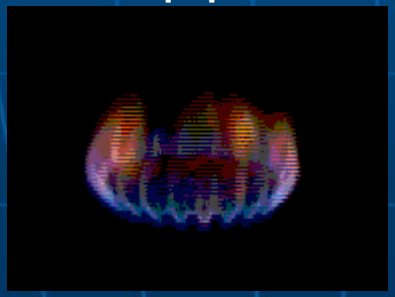
- Work with Pipelines to establish system adjustment gas

2 — Understand "Zone of Influence"

- Work with Pipelines and Suppliers
- Establish reasonable supply compositions

3 — Identify "Potential Sensitive Receptors"

- LDC's catalog potential sensitive customer equipment



4 — Assessment

- Assess sensitive equipment
- Establish extent of retrofits
- Negotiate fixes

5 — Settlement Agreement

- Establish interchangeability Tariff parameters
- Establish most economical retrofit strategy if necessary

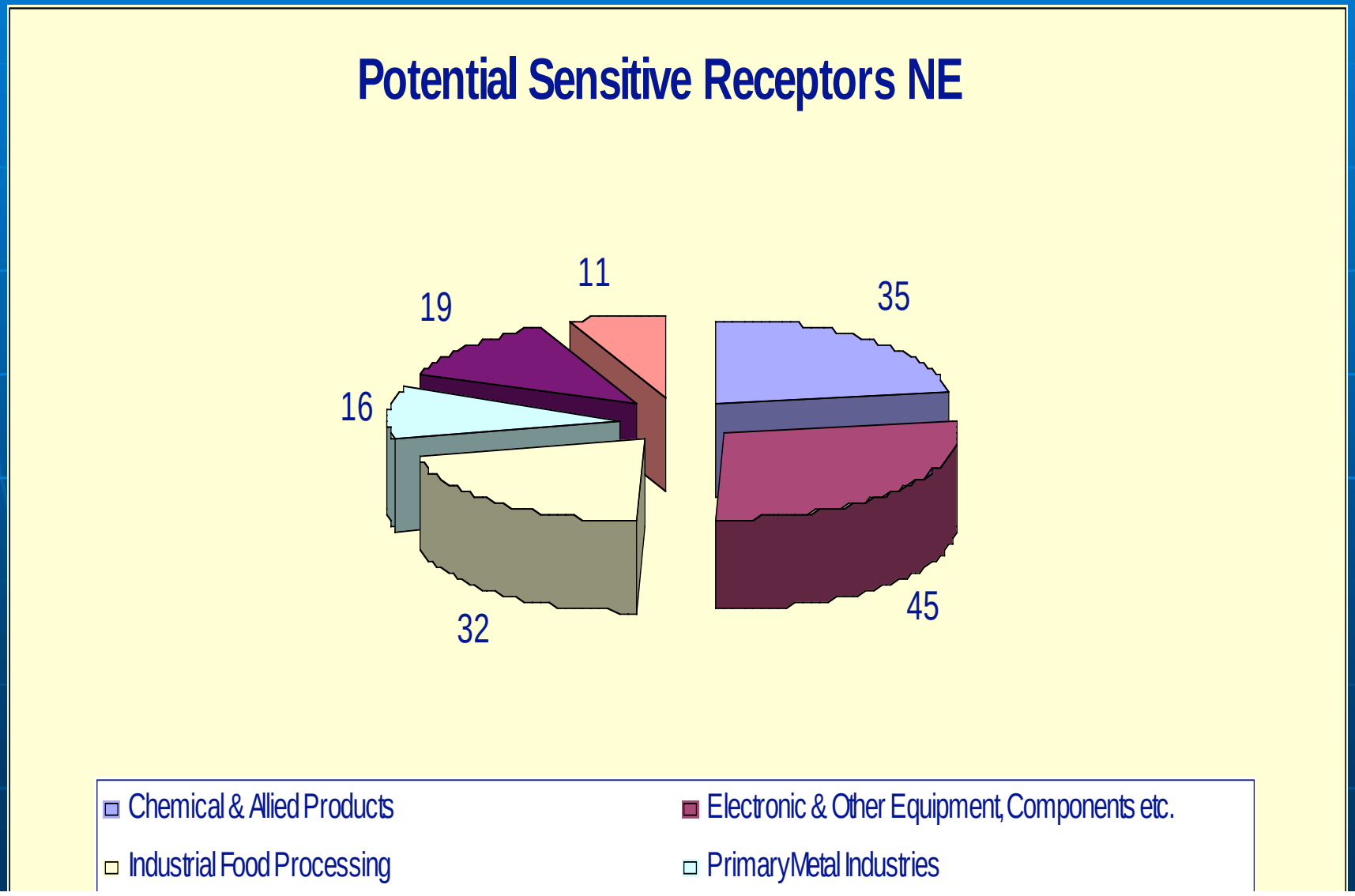
Specific Industry Groups Include:

- Industrial Food Processing
- Chemicals & Allied Products
- Rubber & Miscellaneous Plastics
- Electronic & Other Equipment Components
- Stone, Glass, Clay & Concrete
- Primary Metals Industries

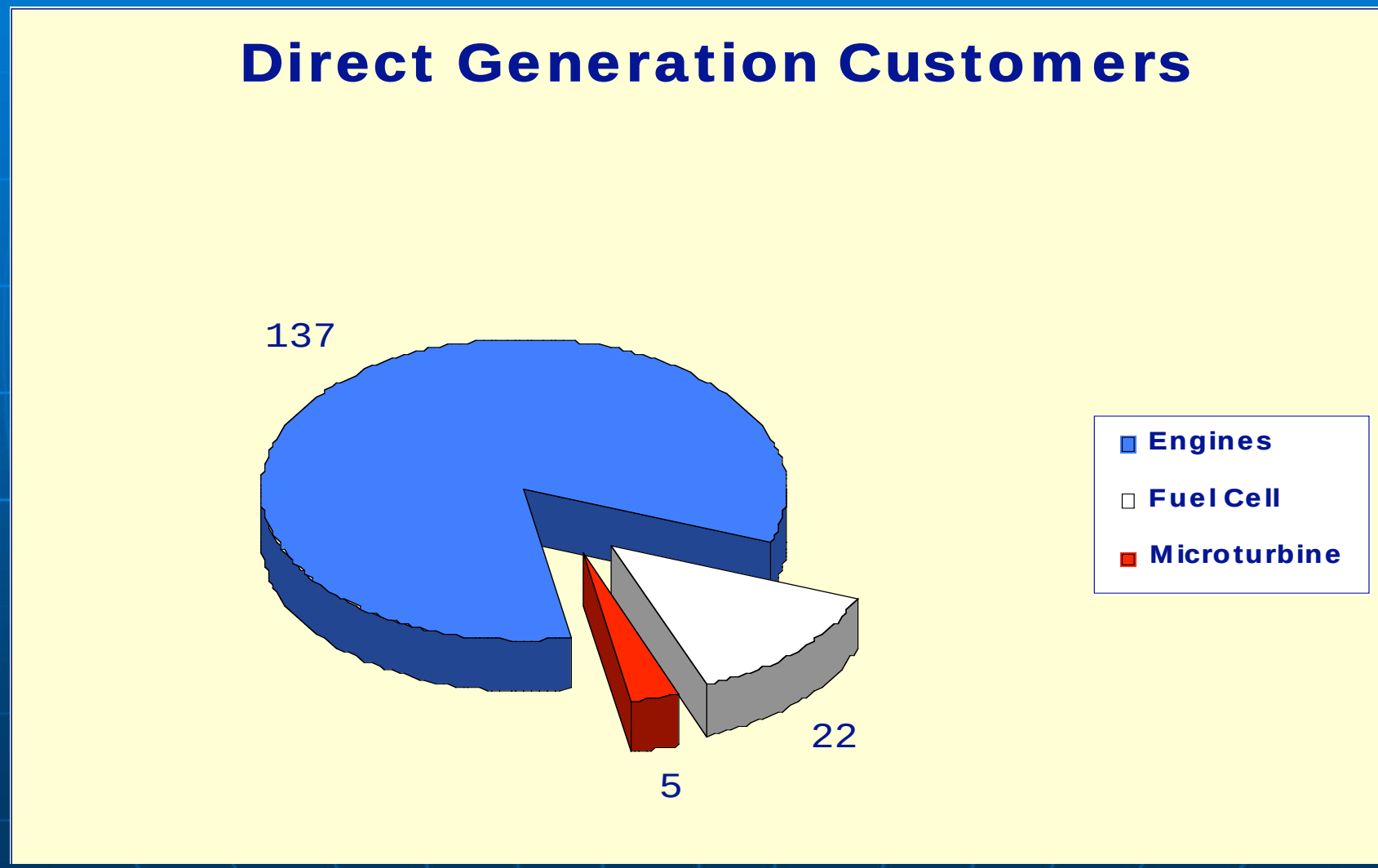
Other Applications Considered

- Distributed Generation
  - Engines/Cogen
  - Fuel Cells
  - Micro Turbines
- Power Generation
  - DLE Gas Turbines
- NGV's
- LNG Liquefaction Plants

KeySpan Identified 158 PSRs in NE



KeySpan Identified 164 DG Applications in NY/NE



KeySpan Identified 370 HD CNG Engines in NE

CNG HEAVY DUTY ENGINES

Manufacturer	Model	Estimated Life (# of years)	Number of Engines	State	Pipeline	Fleet Type	Model Year	Comments
John Deere	6068H (6.8 liter)		3	MA			1999	Tewksbury, MA
John Deere	6081H (8.1 liter)		6	MA			2004	Tewksbury, MA
Cummins	B+ 5.9G		1	MA			2004	Everett, MA
John Deere	6068H (6.8 liter)		2	MA			2001	Newton, MA
Detroit Diesel	Series 50G "MK"		44	MA			2002	Boston, MA
Cummins	C+ 8.3G		190	MA			2003	Boston, MA
[illegible]	[illegible]		[illegible]	[illegible]			[illegible]	[illegible]

KeySpan Assessment Summary

- Industrial Food Processing

  35 Potential Customers, 50-$100MM Load

- Primary Metals Industries

  16 Potential Customers, 50-$150MM Load

- Stone, Clay, Glass & Concrete

  11 Potential Customers, 75-$125MM Load

- Electronic & Other Equipment Components

  4 Potential Customers, > $100MM Load

KeySpan New England Assessment Summary

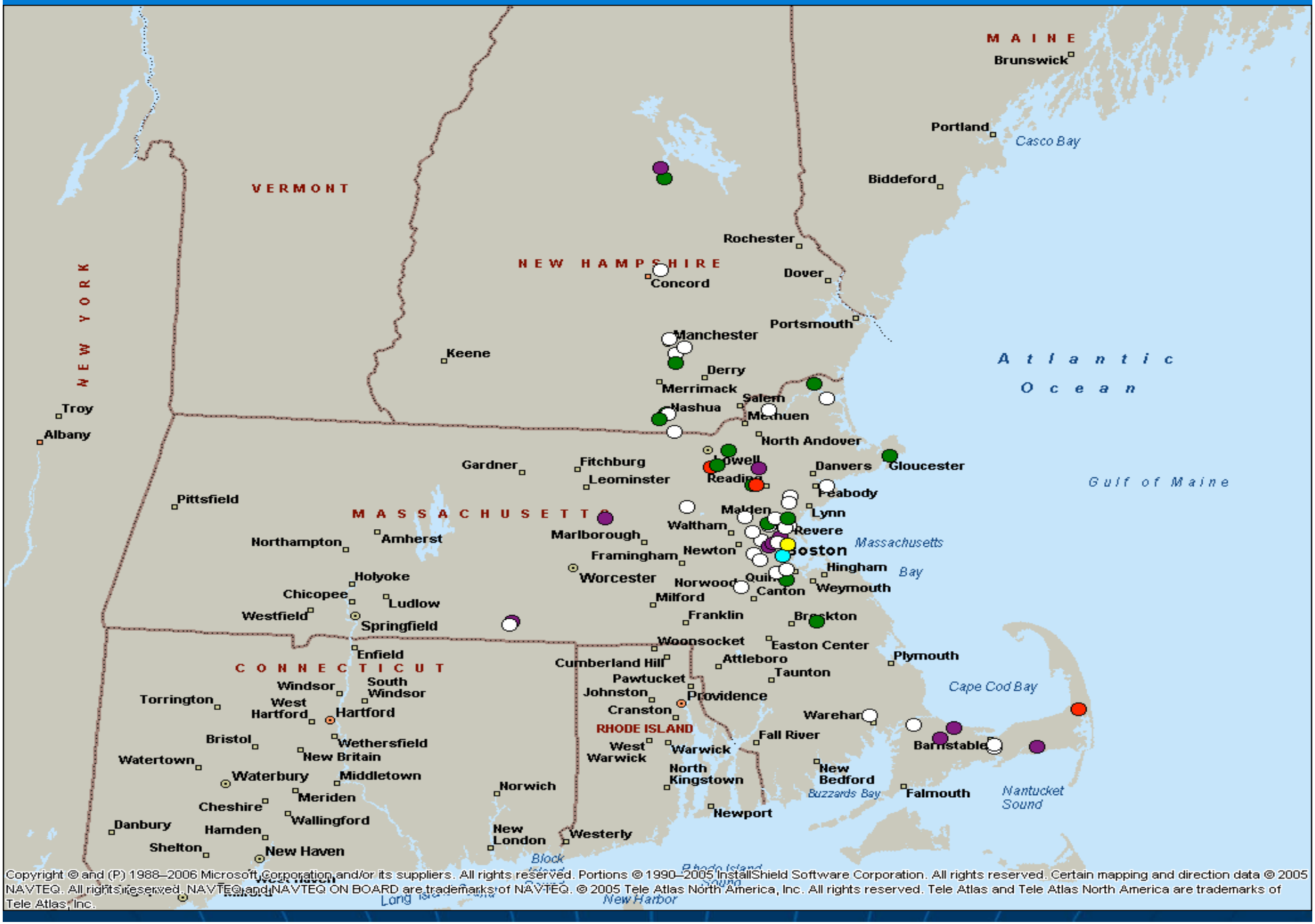
- Heavy Duty Engines

  44 Buses

- LNG Liquefaction

  6MM/Day Open Expansion Cycle

KeySpan Potential Sensitive Receptor Summary



Northeast LNG Liquefaction Plants

- 7 Plants spanning New York through MA
- Critical component of regional supply infrastructure
- Over 66 MM / Day potentially impacted
- Retrofits will most likely be required – some substantial

Interchangeability Implementation Strategy

- Establish a Communications Strategy For Existing Customers
- Establish Guidelines For New Customers
- Assess Installed Appliance Population
- Evaluate / Establish Retrofits For LNG Liquefaction
- Evaluate Potential Elastomer Impacts For Distribution Systems
- Consider DLE Turbine Operations – Consult With Your OEM **NOW !!!**

Policy vs Science
Settlement Agreement Considerations

- Consider NGC+ Interim Guidelines as a foundation
- Consider **realistic LNG compositions** & minimize inert injections
- Establish language & process to allow for future evaluation of retrofits of a material nature based on “real” supply variations
- Build in language allowing for short term excursions that limit end use problems
- ***CLOSE THE “TRUST GAP”***

Settlement Agreement Benefits

- Maximizes supply opportunities while minimizing potential retrofit costs
- Establish a clear path to assessing future retrofits based on specific supply variations
- Retrofit costs of a “material” nature directly related to a specific supply source must be allocated appropriately and made “net” of potential supplemental benefits via mutual agreement.
- Minimizes uncertainty for all parties

Where is the Research ?

- GAMA – New Appliance Testing
- AGA Bulletin 36 Revision
- NYSEARCH / GTI Elastomer Investigation
- NYSEARCH – Assessing & Managing Risks of Maladjusted Appliances
- SoCal – Continues Testing, Completed Heavy Duty Engine Testing
- CEC - Commercial Industrial Burners & Emissions Focus
- **Full Scale DLE Turbine Testing Still Needed ??**

OEM's Stepping Up To The Plate

- Revised Fuel Specifications
- Development of Robust Combustion System Configurations & Retrofit Packages
- Each Facility Needs to Be Assessed Independently Relative to Potential Compositional Changes & Installed Equipment

SUMMARY

- Recognition & Implementation of the **White Paper**, **not simply the interim guidelines** will help bridge the trust gaps
- **KNOW YOUR ADJUSTMENT GAS !!**
- Work collaboratively with Pipelines & Suppliers to establish appropriate tariff requirements based on the **"five step process"**
- Review & Understand FERC's Policy Statement
- Make sure you are talking to your supplier…. your OEM and that you are collecting data today you will need for tomorrow…….